

29 年 09 月 06 日

学位論文審査並びに最終試験結果報告書

大学院歯学研究科長

殿

主査 會田英紀   
副査 越智守生   
副査 斎藤隆史 

今般 Akashlynn Badruddoza Dithi にかかわる学位論文審査並びに最終試験を行い下記の結果を得たので報告する。

記

- 1 学位論文題目 Application of solution plasma surface modification technology to the formation of thin hydroxyapatite film on titanium implants
- 2 論文要旨 別添
- 3 学位論文審査の要旨 別添（様式第 12 号）
- 4 最終試験の要旨 別添（様式第 13 号）

以上の結果 Akashlynn Badruddoza Dithi は博士（歯学）の学位を授与する資格のあるものと判定する。

学位論文審査の要旨

主査 會田英紀  
副査 越智守生  
副査 斎藤隆史



氏 名 Akashlynn Badruddoza Dithi

学位論文題目 Application of solution plasma surface modification technology to the formation of thin hydroxyapatite film on titanium implants.

以下本文（15行目から1000字以内）

Dr. Akashlynn Badruddoza Dithi investigated the effectiveness of solution plasma technology, which has been developed recently; that can be used to achieve a thin and uniform HA layer on porous surfaced titanium implant bodies by heating it in calcium phosphate solution by solution plasma modification technique. With this novel surface modification technique, the temperature of the solution in contact with the titanium can easily be increased with thermal energy generated by the solution plasma and in which case a thin and uniform HA layer is formed on porous surfaced titanium implant, this induces the rapid bone growth into the pore space of the implant body and also enhances biological anchorage. She used polished titanium, Y-TZP and porous surfaced titanium in this study. She polished and alkaline treated the samples before introducing them in calcium phosphate solution for solution plasma treatment. The effectiveness of this solution plasma technology was compared by immersion technique in different temperature (37°C and 60°C) and was evaluated by Scanning Electron Microscopic images, X-ray diffractogram, Bioactivity Analysis and Statistical Analysis. She found that, SEM images of immersion treatment suggested that, the size of the HA spherical particles was too large to coat the titanium implant with porous structure. On the other hand, SEM images of solution plasma treated samples pre-treated by 5M NaOH demonstrated that, fine spherical HA particles were uniformly precipitated over the entire surface including the areas recessed in the shape of the porous structure and also the inner surface of the pores. The XRD indicated that, spherical HA particles precipitated on titanium surfaces were hydroxyapatite. Although the XRD from the Y-TZP surface after solution plasma treatment did not show diffraction peak probably due to fine size of particles or low crystallinity of the precipitates on the Y-TZP surface. Solution plasma treated samples showed significantly better cyto-compatibility than the other specimen. The present study could shed light on a new technology which can be used to achieve a thin and uniform HA layer on porous surfaced titanium implant bodies by heating it in calcium phosphate solution. Chief and sub-reviewers evaluated the present study met the standard of the thesis in the field of dentistry.

最終試験（学力の確認）の要旨

主査

會田 英紀



副査

越智 守生



副査

奇藤 隆史



氏 名 Akashlynn Badruddoza Dithi

以下本文（10行目から200字以内）

Chief and sub investigators discussed with Akashlynn Badruddoza Dithi on her research work and tested whether she could discuss on her work based on the current basic and clinical science in Dentistry. She could logically respond to the questions raised by the reviewers, and her performance was evaluated as she met the standard for the Ph. D degree.